भारतीय मानक
Indian Standard

IS 16219 : 2014
(Reaffirmed 2019)

स्वचल वाहन — धातु की ईंधन टंकी — विशिष्टि

Automotive Vehicles — Metallic Fuel Tanks — Specification

ICS 43.040.60; 43.060.40

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July 2014 **Price Group 3**

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Body, Chassis, Accessories and Garage Equipment Sectional Committee had been approved by the Transport Engineering Division Council.

This standard is one of the series of Indian Standards on fuel tanks. The other standards are:

IS No.	*Title*
12056 : 1987	Recommendation for safety requirements for fuel tank assembly of automotive vehicles
14681 : 1999	Automotive vehicles — Fuel tanks for two or three wheelers
15547 : 2005	Automotive vehicles — Plastic fuel tank for four wheelers

In the formulation of this standard, considerable assistance has been derived from the following publications:

ECE R 34	Uniform provisions concerning the approval of vehicles with regard to the prevention of fire risks
EEC Directive 70/221/EEC	Fuel tanks and rear underrun protection of motor vehicles and their trailers
AIS 095	Requirements for metallic fuel tanks of automotive vehicles

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AUTOMOTIVE VEHICLES — METALLIC FUEL TANKS — SPECIFICATION

1 SCOPE

This standard applies to metallic tanks intended for use with liquid fuel and fitted on vehicles of categories M, N and T as defined in IS 14272 : 2011 'Automotive vehicles — Types — Terminology (*first revision*)'.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
12056 : 1987	Recommendations for safety requirements for fuel tank assembly of automotive vehicles
14272 : 2011	Automotive vehicles — Types — Terminology (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the following terms and definitions shall apply.

3.1 Vehicle Type with Regard to Fuel Tanks — Vehicles which do not differ essentially in such respect as:

a) The structure, shape, dimensions and materials of the tank(s); and
b) In vehicles of category M1 the position of the tank(s) in the vehicle in so far as it has a negative effect on the requirements of **4.10**.

3.2 Occupant Compartment — The space for occupant accommodation bounded by the roof, floor, side walls, doors, outside glazing, front bulkhead and rear bulkhead.

3.3 Tank — The metallic tank(s) designed to contain the liquid fuel, as defined in **3.5** used primarily for the propulsion of the vehicle excluding its accessories (filler pipe if it is a separate element), gauge, connections to the engine or to compensate interior excess pressure, etc.

3.4 Capacity of the Tank — The tank capacity as specified by the manufacturer.

3.5 Liquid Fuel — A fuel which is liquid in normal ambient conditions.

4 GENERAL REQUIREMENTS

4.1 Tanks shall be so made as to be corrosion-resistant.

4.2 Tanks shall satisfy, when equipped with all accessories, which are normally attached to them, the leakage tests carried out according to **5.1** at a relative internal pressure equal to double the working pressure, but in any event not less than an excess pressure above atmosphere of 0.3 bar.

4.3 Any excess pressure or any pressure exceeding the working pressure shall be compensated automatically by suitable devices (vents, safety valves, etc).

4.4 The vents shall be designed in such a way as to prevent any fire risk. In particular, any fuel which may leak when the tank(s) is (are) being filled shall not be able to fall on the exhaust system. It shall be channeled to the ground.

4.5 The tank(s) shall not be situated in, or form, a surface (floor, wall, bulkhead) of the occupant compartment or any other compartment integral with it.

4.6 A partition shall be provided to separate the occupant compartment from the tank(s). The partition may contain apertures (for example to accommodate cables) provided they are so arranged that fuel cannot flow freely from the tank(s) into the occupant compartment or any other compartment integral with it during normal conditions of use.

4.7 Every tank shall be securely fixed and so placed as to ensure that any fuel leaking from the tank or its accessories will escape to the ground and not into the occupant compartment during normal conditions of use.

4.8 The filler hole shall not be situated in the occupant compartment, in the luggage compartment or in the engine compartment.

4.9 The fuel shall not escape through the tank cap or through the devices provided to compensate excess pressure during foreseeable course of operation of the vehicles. In the case of overturning of the vehicle, a drip may be tolerated provided that it does not exceed 30 g/min; this requirement shall be verified during the test prescribed in **5.2**.

4.9.1 The fuel filler cap shall be fixed to the filler pipe. This requirement shall be deemed to be satisfied if provision is made to prevent excess evaporative emissions and fuel spillage caused by a missing fuel filler cap. This may be achieved using one of the following:

a) An automatically opening and closing, non-removable fuel filler cap.
b) Design features, which avoid excess evaporative emissions and fuel spillage in the case of a missing fuel filler cap.
c) Any other provision which has the same effect. Examples may include, but are not limited to a tether filler cap, a chained filled cap or one utilizing the same locking key for the filler cap and for the vehicle's ignition. In this case, the key shall be removable from the filler cap only in the locked condition. However, the use of tethered or chained filler cap by itself is not sufficient for vehicles other than those of Categories M1, N1 and M2 derived from M1.

4.9.2 The seal between the cap and the filler pipe shall be retained securely in place. The cap shall latch securely in place against the seal and filler pipe when closed.

4.10 Tanks shall be installed in such a way as to be protected from the consequences of an impact to the front or the rear of the vehicle; there shall be no protruding parts, sharp edges, etc., near the tank.

4.11 The fuel tank and the filler neck shall be designed and installed in the vehicles in such a way as to avoid any accumulation of static electricity charges on their entire surface. If necessary, they shall be discharged into the metallic structure of the chassis or any major metallic mass by means of a good conductor.

5 TESTS

5.1 Hydraulic Test

5.1.1 The tank shall be subjected to a hydraulic internal pressure test, which shall be carried out on an isolated unit complete with all its accessories. The tank shall be completely filled with a non-flammable liquid (water, for example). After all communication with the outside has been cut off, the pressure shall be gradually increased, through the pipe connection through which fuel is fed to the engine, to a relative internal pressure equal to double the working pressure used and in any case not less than a gauge pressure of 0.3 bar, which shall be maintained for one minute. During this time the tank shell shall not crack or leak; however, it may be permanently deformed.

5.1.2 Fuel tanks which have been demonstrated to comply with the requirements of **4.3** of IS 12056 shall be deemed to comply with the requirements of **5.1**.

5.2 Overturn Test

5.2.1 The tank and all its accessories shall be mounted on to a test fixture in a manner corresponding to the mode of installation on the vehicle for which the tank is intended; this also applies to a system for the compensation of the interior excess pressure.

5.2.2 The test fixture shall rotate about an axis lying parallel to the longitudinal vehicle axis.

5.2.3 The test shall be carried out with the tank filled to 90 percent of its capacity and also 30 percent of its capacity with a non-flammable liquid having a density and a viscosity close to those of the fuel normally used (water may be accepted).

5.2.4 The tank shall be turned from its installed position 90° to the right. The tank shall remain in this position, for at least 5 min.

5.2.5 The tank shall then be turned 90° further in the same direction. The tank shall be held in this position, in which it is completely inverted, for at least another 5 min.

5.2.6 The tank shall be rotated back to its normal position. Testing liquid which has not flowed back from the venting system into the tank shall be drained and replenished, if necessary.

5.2.7 The tank shall be rotated 90° in the opposite direction and left for at least 5 min in this position.

5.2.8 The tank shall be rotated 90° further in the same direction. This completely inverted position shall be maintained for at least 5 min. Afterwards, the tank shall be rotated back to its normal position.

6 APPLICATIONS FOR APPROVAL

6.1 The application for approval shall be accompanied with the information listed in Annex A.

6.2 Two sets of fuel tanks and required accessories shall be offered to the test agency for checking compliance to this standard.

7 CONFORMITY OF PRODUCTION

For ensuring conformity of production one fuel tank shall be demonstrated to comply with the requirements of hydraulic test once in every two months.

8 CRITERIA FOR EXTENSION OF APPROVAL

8.1 As existing approval for a liquid fuel tank system shall be deemed as being extendable to another system without evaluation if the change between the systems

is limited to corrosion protection on the tank or its accessories is changed from one type to another.

8.2 Fitment of the same fuel tank (with respect to structure, shape, dimensions and material of tank) on another vehicle or at another location on the same vehicle. However, these relocations shall not adversely affect the requirements of **4.10** on vehicles of category M1.

9 MARKING

9.1 The fuel tank shall be legibly and indelibly marked with the following:

a) Manufacturer's name or trade-mark;
b) Batch No./ Lot No.; and
c) Month and year of manufacture.

9.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

9.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The detail of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 6.1)

INFORMATION TO BE FURNISHED BY THE FUEL TANK MANUFACTURER

A-1 Information to be furnished by the fuel tank manufacturer:

a) Name and address of the fuel tank manufacturer;
b) Type of fuel stored in the tank;
c) Fuel tank capacity;
d) Material of the tank;
e) Detailed engineering drawing and technical specifications of the fuel tank with all connections and details of breathing/venting arrangement; and
f) Working pressure of the tank.

A-2 Information to be furnished by the vehicle manufacturer:

a) Name and address of the vehicle manufacturer;
b) Category of the vehicle(s) as per IS 14272;
c) Vehicle model/Variants; and
d) Sketch showing location and mounting of the fuel tank on the vehicle.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Automotive Body, Chassis, Accessories and Garage Equipment, Sectional Committee, TED 06

Organization	*Representative(s)*
Automotive Research Association of India, Pune	Shri A. V. Mannikar (***Chairman***)
Asahi India Glass Ltd, Distt Rewari	Shri Mirza Asif Beg
Ashok Leyland Ltd, Chennai	Shri Alfred Nixon Mendez Shri S. Arun (*Alternate*)
Association of State Road Transport Undertakings, New Delhi	Director (Technical)
Autoliv IFB India Ltd, Bangalore	Shri V. Raghu Shri S. Rangarajan (*Alternate*)
Automotive Component Manufacturers Association, New Delhi	Shri Uday Harite Shri Jitender Rana (*Alternate*)
Bajaj Auto Ltd, Pune	Shri R. Narasimhan Shri A. V. Kumbhar (*Alternate*)
Central Institute of Road Transport, Pune	Shri D. P. Saste Shri T. R. Maitre (*Alternate*)
Central Farm Machinery Training & Testing Institute (CFMTTI), P.O. Budni (M.P.)	Shri C. R. Lohi Shri C. V. Chimote (*Alternate*)
Controllerate of Quality Assurance (Vehicles), Ahmednagar	Joint Controller (QAD-B) Deputy Controller (QAD-B)] (*Alternate*)
Eicher Tractors, Pithampur	Shri Rajinder S. Sachdeva Shri Vimal Mulchandani (*Alternate*)
Force Motors Ltd, Pune	Shri P. R. Shivaraman Shri L. B. Patil (*Alternate*)
General Motors India Pvt Ltd, Halol	Shri Neeraj Gupta Shri Rajendra Khile (*Alternate*)
ICAT, Manesar	Shri S. Kalia
Institute of Road Traffic Education (IRTE), New Delhi	Shri Rohit Baluja Shri G.C. Kukreti (*Alternate*)
Kum. Rajshree Parmar Memorial Foundation, Pune	Shri Chandmal M. Parmar
Maharashtra State Road Transport Corporation, Mumbai	Shri S. P. Jadhav Shri Karate (*Alternate*)
Mahindra & Mahindra Ltd, Nashik	Shri B. Bhaumik Shri Z.A. Mujawar (*Alternate*)
Mahindra Trucks and Buses Limited, Pune	Shri K. Nagaraju Shri V. G. Kulkarni (*Alternate*)
Maruti Suzuki India Ltd, Gurgaon	Shri Jitendra Malhotra Shri Deepak Panda (*Alternate*)
Ministry of Heavy Industries & Public Enterprises, New Delhi	Shri B. N. Das Shri R.K. Jaiswal (*Alternate*)
Ministry of Road Transport & Highways, New Delhi	Director (Road Transport)
Transport Commissioner Office, Mumbai	Shri P. B. Jadhav
Ordnance Factory Board, Vehicle Factory, Jabalpur	Shri P. K. Arora Shri A. K. Maurya (*Alternate*)
Rane TRW Steering Systems Ltd, Singaperumal Koil	Shri B. Ayyappan Shri L. Radhakrishnan (*Alternate*)
Ruby Bus Pvt Ltd, Mumbai	Shri Pankaj D. Kapashi Shri V. M. Bhise (*Alternate*)
MSME, Delhi	Shri K. L. Rao Shri K. K. Funda (*Alternate*)
Society of Indian Automobile Manufacturers' (SIAM), New Dehli	Shri K. K. Gandhi Shri Amit Kumar (*Alternate*)

Organization	*Representative (s)*
Sutlej Motors Ltd, Jallandhar	SHRI K. S. WILKHU
Swaraj Mazda Ltd, Ropar	SHRI S. R. AGRAHARI SHRI LAKHINDER SINGH (*Alternate*)
Tata Motors Ltd, Pune	SHRI P. K. BANERJEE SHRI FIROZ KHAN (*Alternate*)
Toyota Kirloskar Motors Ltd, Bangalore	SHRI SUDEEP DALVI SHRI S. SAKTHIVELAN (*Alternate*)
Tractor Manufacturers' Association, New Delhi	SHRI T. C. GOPALAN SHRI T. R. KESAVAN (*Alternate*)
Vehicles Research & Development Establishment, Ahmednagar	SHRI D. PANDURENGAN SHRI S. RAMAKRISHNA (*Alternate*)
Venkos & Compan, Patna	SHRI V. N. SHARMA SHRI SAIFUDDIN HUSSAIN (*Alternate*)
Volvo India Pvt Ltd, Bangalore	SHRI KARTHIK SARMA SHRI P. K. HUGAR (*Alternate*)
BIS Directorate General	SHRI P. C. JOSHI, Scientist 'F' and Head (TED) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRI D. K. SINGLA
Scientist 'D' (TED), BIS

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Amendments Issued Since Publication

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AMENDMENT NO. 1 JANUARY 2019
TO
IS 16219 : 2014 AUTOMOTIVE VEHICLES — METALLIC FUEL TANKS — SPECIFICATION

[*Page* 2, *clause* **4.9.1** c)] — Substitute the following for the existing:

'c) Any other provision which has the same effect. Examples may include, but are not limited to a tether filler cap, a chained filled cap or one utilizing the same locking key for the filler cap and for the vehicle's ignition. In this case, the key shall be removable from the filler cap only in the locked condition. However, the use of tethered or chained filler cap by itself is not sufficient for vehicles other than those of categories M1 and N1. In case of M2 category of vehicles having fuel filler cover for accessing fuel cap, tethered or chained fuel cap is sufficient, provided, fuel filler cover has locking mechanism which can be opened either with key or with control located inside the vehicle.'

(*Page* 2, *clause* **7**) — Substitute the following for the existing:

'**7 CONFORMITY OF PRODUCTION**

For ensuring conformity of production one fuel tank shall be demonstrated to comply with the requirements of hydraulic test once in every two years.'

(*Page* 3, *clause* **9.1**) — 'Delete the clause and renumber **9.2** and **9.2.1** as **9.1** and **9.1.1**.'

(TED 06)

Publication Unit, BIS, New Delhi, India